Renewable Energy

energy team
clean energy, clean environment

Wind Power

U.S. Environmental Protection Agency • April 2004 www.epa.gov/ne

Wind Power in New Hampshire

Wind resources can be used with both large wind turbines for utility applications and with small wind turbines for on-site generation. As a renewable resource, wind is classified according to wind power classes, which are based on typical wind speeds. These classes range from class 1 (the lowest) to class 7 (the highest). In general, wind power class 3 or higher can be useful for generating wind power with large (utility-scale) turbines, and small turbines can be used at any wind speed. Class 4 and above are considered good resources.

WIND POWER CLASS	50m (164 ft) WIND POWER* W/m^2	SPEED m/s †	mph
	0	0	0
1			
	200	5.6	12.5
2			
	300	6.4	14.3
3			
	400	7.0	15.7
4			
	500	7.5	16.8
5			
	600	8.0	17.9
6			
	800	8.8	19.7
7			
	2000	11.9	26.6

RIDGE CREST ESTIMATES (LOCAL RELIEF > 1000 FT)
* Wind Power Density - watts per square meter
† meters per second

According to analysis conducted by the US Department of Energy, New Hampshire has excellent wind resources in parts of the state. The primary areas of good onshore wind energy resources (class 4 through 7) are the exposed hilltops, ridge crests, and mountain summits in the White Mountains.

Wind Power Potential

An extensive area of New England, including most of Vermont and New Hampshire, as well as much of Maine, Massachusetts, and Connecticut, has annual average wind power of class 3 or higher on exposed locations. In New Hampshire, the highest powers (class 5 and 6) occur on the best-exposed mountain and ridge tops in the White Mountains. The remainder of the hilltops and mountain tops in this area that are outside of these ranges have class 3 or 4 wind power. At the highest elevations this wind power increases to class 6 and 7 in the winter. Average wind speeds may vary significantly from one ridge crest to another and are primarily influenced by the height and slope of the ridge, orientation to the prevailing winds, and the proximity of other mountains and ridges. For example, much of the White Mountains are indicated to have class 6 wind power, but Mount Washington, at 1,917 m (6,288 ft) elevation, is known to have considerably greater wind power as a result of terrain-induced acceleration as the air passes over the mountain.

Though siting decisions regarding individual wind facilities are up to state and local officials, DOE has estimated that approximately 3% of New Hampshire's land area may be suitable for wind power development. Where did these estimates come from? First, they excluded the land which has a wind power class of 2 or less-the nonusable resources. Then, they excluded land with urban development or land that is environmentally sensitive. Assuming there may be other land-use conflicts as well, they subtracted out 50% of forest land, 30% of farmland, and 10% of rangeland, resulting in about 3% of the state of New Hampshire having good winds and being available for development.

According to these estimates, if all of the wind energy potential was developed with utility-scale wind turbines, the power produced each year could equal 5,000,000 megawatt-hours - or 55% of the entire state's electricity consumption. *(see back for current state of wind power in New England)*

EPA
New England

1 Congress Street
Suite 1100
Boston, MA 02114

EPA Energy Team Contact:
John Moskal
617-918-1826
moskal.john@epa.gov

continued on back

Current and Proposed Wind Projects in New England

Existing Wind Projects

Location	Size (in Megawatts)	Number of towers	Facility Area (acres)	Height of tower (feet)	Length of Rotor (feet)
Holyoke, MA	0.25	1	< 1	80	40
Hull, MA	0.66	1	< 1	164	75
Princeton, MA	0.32	8	16	100	22
Madawaska, ME	0.05	1	< 1	100	25
Orland, ME	0.05	1	< 1	100	25
Searsburg, VT	6.0	11	35	131	66

Proposed Expansion of Existing Wind Projects

Location	Added Capacity (in Megawatts)
Hull, MA	1.5-5.0
Princeton, MA	3
Searsburg, VT	30-40

Proposed Wind Projects

Location	Size (in Megawatts)
Hancock, MA	13.5
Monroe, MA	28.8
Nantucket Sound, MA	420
Mars Hill, ME	40-50
Phillips, ME	52
Manchester, VT	9
East Haven, VT	6

Current and Proposed Wind Projects in New England